

Notice of Allowability	Application No.	Applicant(s)	
	09/883,174	KATO ET AL.	
	Examiner	Art Unit	
	Dac V. Ha	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to application filed on 06/19/01.
2. ☒ The allowed claim(s) is/are 1-9, renumbered as 1-9, respectively.
3. ☒ The drawings filed on 19 June 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>6/19/01, 03/02/04</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Randolph A. Smith (Reg. No. 32,548) on 09/30/04.

The application has been amended as follows:

Claim 1:

Line 2, "VSB" has been changed to --vestigial sideband (VSB)--

Lines 22-23, "a symbol clock received signal" has been changed to --the symbol clock received signal--

Line 24, "receiving device" has been changed to --the receiving device--

Claim 2:

Line 2, "VSB" has been changed to --vestigial sideband (VSB)--

Line 44, "receiving device" has been changed to --the receiving device--

Claim 4:

Line 2, "VSB" has been changed to --vestigial sideband (VSB)--

Line 50, "the symbol clock" has been changed to --a symbol clock--

Claim 5:

Lines 2-3, "said reference clock signal generator" has been changed to --the reference clock signal generator--

Claim 6:

Line 2, "VSB" has been changed to --vestigial sideband (VSB)--

Line 6, "the tendency" has been changed to --a tendency--

Line 7, "the value" has been changed to --a value--

Lines 9-10, "the proper symbol data" has been changed to --a proper symbol data--

Lines 12-13, "said symbol value error detection section" has been changed to --said symbol data error detection section--

Claim 7:

Line 3, "a resulting value" has been changed to --the subtraction result--

Claim 8:

Line 2, "said symbol value error detection section" has been changed to --said symbol data error detection section--

2. The following is an examiner's statement of reasons for allowance:

The present invention relates to a clock recovery circuit, which is incorporated in a receiving device for digital television broadcasts using a VSB modulation method. In the conventional clock recovery circuit, the phase error between the symbol clock of the received VSB signal and the reference clock of the receiving device is detected using data segment sync, which exist for each of the 832 symbols. Due to this, it becomes impossible to perform high speed tracking of the synchronous clock signal when the received signal is varying over time. The present invention implements a clock recovery circuit which can perform high speed tracking even when the received signal varies over

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time, by performing phase error detection for each of the symbols of the received signal individually. Prior art of record (closest reference Strolle et al. – US 5,872,815 and Bouillet et al. – US 6,445,423), taken individually or collectively, fails to suggest a motivation for incorporating in a clock recovery circuit, including the particular structure, as claimed, in independent claims 1, 2, 4, 6 (claims 3, 5, 7-9 depend therefrom). For example, prior art or record, fails to fairly teach a clock recovery circuit including:

“first band pass filter which, when a symbol rate of received signal extracts a signal of an frequency component from an in-phase component of a VSB signal which has been converted to baseband;

second band pass filter which extracts a signal of an $f_s/2$ frequency component from a quadrature-phase component of said VSB signal ;

a delay element which delays an output signal of said second band pass filter by $\pi/4$;

a first multiplier which squares an output signal of said first band pass filter;

second multiplier which squares an output signal of said delay element;

an adder which adds together an output signal of said first multiplier and an output signal of said second multiplier;

a third band pass filter which extracts a signal of an f_s frequency component from an output signal of said adder, and outputs a symbol clock received signal” in independent claim 1 or;

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“a tendency detection section which, when successive symbol data in time series in a VSB signal which has been converted to baseband are termed D1, D2, and D3, detects a tendency from by a value of symbol data amount of change;

a symbol data error detection section which detects an amount of deviation of a D2 symbol value with respect to a proper symbol data (the proper mapping value);

a multiplier which multiplies together an output value of said tendency detection section and an output value of said symbol data error detection section;

a region decision section which, based upon a symbol value of D2, decides whether a currently received symbol is present in a data update region or is present in a data holding region, and which performs control so as, said currently received symbol is present multiplication by said multiplier, while, if said currently received symbol present in said data holding region, not to output said result of multiplication by said multiplier;

an averaging circuit which averages the output signal of said region decision section once every predetermined number of in said data update region, to output a result of times” in independent claim 6. Thus, claims 1-9 are found to be novel and unobvious over prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Strolle et al. (US 5,872,815) disclose Apparatus For Generating Timing Signals For A Digital Television Signal Receiver.

Bouillet et al. (US 6,445,423) disclose Controlled Oscillator In A Digital Symbol Timing Recovery Network.

Kim (US 5,859,671) disclose Symbol Timing Recovery Circuit And Method.

Gathener (US 5,802,461) discloses Apparatus And Method For Timing Recovery In Vestigial Sideband Modulation.

Okada et al. (US 5,787,123) disclose Receiver For Orthogonal Frequency Division Multiplexed Signals.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dac V. Ha whose telephone number is 571-273-3040. The examiner can normally be reached on 5/4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Dac V. Ha", with a long horizontal line extending from the end of the signature.

Dac V. Ha
Examiner
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